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Ananth Hariharan, Craig Huneke and Javid Validashti* (jvalidas@illinois.edu). *Lech's Inequality*. Preliminary report.

Let R be a Noetherian local ring with maximal ideal \mathfrak{m} and dimension d . For an \mathfrak{m} -primary ideal I in R , Lech has shown that $e(I) \leq d! \lambda(R/I)e(R)$, where $e(-)$ denotes the Hilbert-Samuel multiplicity and $\lambda(-)$ denotes the length. One can argue that asymptotically this inequality is sharp, but in general it gives a very weak bound for $e(I)$. In a joint work with H. Hariharan and C. Huneke, we explore refinements of the Lech's inequality and the consequent inequalities on the Hilbert coefficients of I . (Received September 25, 2012)